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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,207	12/31/2003	Hongwen Ren	UCF-341DIV	9202
23717	7590	11/15/2004	EXAMINER	
LAW OFFICES OF BRIAN S STEINBERGER 101 BREVARD AVENUE COCOA, FL 32922			NGUYEN, HOAN C	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/750,207

Applicant(s)

REN ET AL.

Examiner

HOAN C. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 8/2/04.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.  
4a) Of the above claim(s) 15-24 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-24 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Species A and Group I (claims 1-14) in Paper on Aug. 20 2004 is acknowledged.

Applicant's arguments regarding the restriction requirement have been considered; however, the traversal was on the grounds that there is no serious burden on the Examiner in examining all of claims 1-24 together. This is found persuasive since there is the other method for forming an electronic lens with using a patterned photo mask.

Claims 25-38 are cancelled. Claims 1-24 are elected for group I.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 4-6, 8-12, 15-16 and 18-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahara (US 6219113 B1).

In regard to claims 1, 8, 10 and 12, Takahara teaches (Figs. 62, 69-71) a method of forming an electronic lens, comprising the steps of:

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- forming a lens (see comparing between Fig. 71a and 71c) with a layer of inhomogeneous liquid crystal droplet sizes (e.g. Fig. 62);
- passing a beam of light through the layer; and
- turning a refractive index profile (col. 57, lines 5-6) of the light beam passing through the lens with a source of voltage.
- forming a prism 642 from the lens 641 (claim 10)
- forming an array of the lens 641 for broadband beam steering (claims 8 and 12).

In regard to claims 15-16 and 19-20, Takahara teaches (Figs. 18, 62, 69-71) a method of fabricating an inhomogeneous layer of liquid crystal droplets comprising the steps of:

- forming a patterned photo mask (optical coupling 691 and light shield film 202 consider as mask);
- positioning a liquid crystal layer 21/315 on one side of the mask substrates 11;
- applying Ultra-violet (UV) light 183 to a second side of the mask; and
- forming an inhomogeneous layer of liquid crystal (LC) droplets with the applied ultraviolet light with varying the refraction indices.
- forming a lens/prism 641/642 with the photomask (claim 16 and 19-20)

wherein

Claims 4-5 and 18:

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- the step of forming the lens includes the step of: forming a positive lens with applying sizes of the LC droplets which gradually increases from a center area of the layer to side edges of the layer. The UV make the mixture 315 phase-separation with density distribution between the resin component and light component occurring on the pixel electrode 14 with refractive index increasing from center (col. 57 lines 5-6). However, the physical property of liquid crystal: size of droplet is proportional to refractive index: a larger droplet size, a higher refractive index (see references in conclusion).

Claim 6:

- the step of tuning includes step of: applying a uniform voltage to the layer of the LC droplets for the tuning of the refractive index profile of the lens as Fig. 71b shown.

Claims 9 and 21-22:

- forming a Fresnel lens by using a circular zoned patterned mask as Figs. 104 and 105 shown (col. 3 lines 44-46).

Claim 11:

- forming a switchable prism by splitting a middle pixel so that mixture 315 has phase separated at middle pixel as Fig. 69 shown.

Claim 23:

- the step of supporting includes the step of: supporting polymer dispersed liquid crystal layer (col. 57 lines 35-37).

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahara (US 6219113 B1).

Takahara discloses ONLY the POSITIVE lens, which is formed by the liquid crystal droplets having sizes increasing gradually from a center area of the layer to side edge of the layer.

However, Takahara does not disclose the NEGATIVE lens, which is formed by the liquid crystal droplets having sizes decreasing gradually from a center area of the layer to side edge of the layer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the POSITIVE lens into the NEGATIVE lens, since it has been held that a mere reversal of the essential working parts (liquid crystal droplet sizes changes from “increasing from center” to “decreasing from center”) of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

3. Claims 7 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahara (US 6219113 B1) as applied to claims 1, 4-6, 8-12, 15-16 and 18-23 in view of Lewis et al. (US 6271899 B1).

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Takahara fails to disclose the LC droplets including nano-scale polymer-dispersed droplets.

Lewis et al. teach the LC droplets including nano-scale polymer-dispersed droplets for preventing scattering cross section of the droplets at visible wavelengths and the medium appears isotropic while the average refractive index of the individual droplets, however, is essentially the same as in the case of a conventional large droplet PDLC material (col 4 lines 1-9).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify method of forming an electronic lens as Takahara disclosed with the LC droplets including nano-scale polymer-dispersed droplets for preventing scattering cross section of the droplets at visible wavelengths and the medium appears isotropic while the average refractive index of the individual droplets, however, is essentially the same as in the case of a conventional large droplet PDLC material as taught by Lewis et al. (col 4 lines 1-9).

4. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahara (US 6219113 B1).

In conventional art, the eyeglass lens and zoom lens on a camera can be manufactured by liquid crystal. However, conventional art does not disclose the droplet liquid crystal being formed as claim 1 cited.

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Takahara teach the the eyeglass lens and zoom lens on a camera can be manufactured by liquid crystal with method steps cited in claim 1 for improving display contrast and enlarging visual filed angle (col. 57 lines 45-47).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Tanaka et al. (US 5748272 A) disclose a polymer dispersed liquid crystal optical device is presented which has optical elements, which control reflection, transmission and diffraction of incident light entering the device by adjusting the magnitude of the electrical field applied to the device between a maximum and a minimum limits. The large droplet layer 27 containing a large amount of liquid crystal will exhibit a large change in the refractive index, and the refractive index of the optical elements will be altered. The small droplet layer 25 containing a small amount of liquid crystal will be relatively insensitive to the field, and the on-state refractive index of the small droplet layer will remain small.

Omae et al. (US5963283A) disclose a liquid crystal panel with the liquid crystal drops existing as independent droplets at a liquid crystal content of less than approximately 60%, and a continuous layer of intermingled polymer and liquid crystals is formed at greater than approximately 60%.

Doane et al. (US5093735A) disclose the dispersion taking the form of droplets of liquid crystal in a polymer matrix, the feature size is the diameter of the droplets.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim H Robert can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HOAN C. NGUYEN  
Examiner  
Art Unit 2871

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TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER